Decade of the 70's

Energy crunch brings expanded INEL role

During the 70's, nuclear research continued to be the major mission at the Department of Energy's Idaho National Engineering Laboratory.

But the growing energy crunch brought the site an expanded role in several areas of alternative energy research . . . geothermal, small dam hydroelectric, conservation and fusion.

DOE's associated energy research and development programs at the INEL required increased employment and payrolls over the decade. Employment increased from 6,000 employees in 1970 to 9,700 in 1979. Dr. Charles Williams, manager of DOE's Idaho Operations Office said the immediate outlook is for employment to remain close to present levels for the next several years.

DOE's estimated total Idaho program costs for 1980 are $359 million, compared to $320 million for the previous year. Most of the increase is for constructions costs. In 1970, the budget was $97.1 million, with payrolls accounting for $66.3 million. Payrolls totaled an estimated $200 million in 1979.

Accidents simulated

In early 1979, reactor safety research focused on the hypothetical large pipe break loss of coolant accidents. Two tests at the Loss of Fluid Test Facility (LOFT) indicated that safety margins for those type accidents were greater than believed. For example, fuel-cladding temperatures were several hundred degrees fahrenheit less than even the "best estimate" computer predictions.

In mid-year, the Three Mile Island (TMI) accident redirected the emphasis of many programs toward investigating the more probable small break loss of coolant accidents. LOFT conducted two tests to study instrumentation adequacy and computer code capability. Days after the TMI accident, the Semiscale Facility performed several experiments to provide data used to determine the most appropriate recovery techniques at the Pennsylvania facility. Similar tests are scheduled for 1980.

Waste management improved

The 70's brought changes in methods for handling nuclear wastes. The site began storing low level transuranic (chiefly plutonium) wastes in an above ground storage system. Previously those wastes were buried in trenches. These wastes are scheduled for eventual disposal in a permanent federal repository, once one is opened. Meanwhile, storage above the ground allows for easy retrievability.

The site inaugurated an underground storage system for intermediate level transuranic wastes, mostly contaminated equipment, rags, vials, etc. Employees placed materials in 30-gallon drums, then put them in vertical steel vaults 20-30 feet deep.

Large, movable, tent-like buildings were erected at the Waste Management Areas to protect workers and stored wastes from adverse climate conditions.

Waste management experts also began to retrieve wastes buried in earlier years to study what problems might be involved. This information is being used to prepare environmental impact statement alternatives for long-term management of the transuranic waste.

By 1979, experts had turned their attention to the Slagging Pyrolysis Incinerator Project. This facility, to be constructed in the early 1980's, will incinerate at high temperatures low-level transuranic wastes and immobilize their radioactivity in an inert, rock-like slag. This rock-like slag, cast into steel containers, will be acceptable for disposal at a fede repositor The process also will reduce the vo ne of was

ENICO succeeds Allied

When Exxon Nuclear Idaho Company, Inc., succeeded Allied Chemical in 1979, several construction projects already were underway at the Chemical Processing Plant. Construction had started on a $150 million fuel storage facility to receive, store and process government-owned irradiated reactor fuels. The new Fluorinal and Fuel Storage Facility is scheduled to be in operation by 1984.

Another new facility, a $90 million Waste Calcining Facility, will replace current facilities which have been in operation since 1963. The new facility is designed to convert 3,000 gallons of liquids daily into about one-eighth as much volume of solids.

In other nuclear research, Argonne National Laboratory-West continued its development of breeder-reactor technology. Experimental Breeder Reactor II is the nation's primary irradiation facility for breeder-reactor fuels and materials and the nation's only breeder reactor power plant. That plant has irradiated more than 10,000 fuels and materials specimens and has produced more than one billion kilowatt hours of electricity.

Facilities added at ANL-W

In the past decade, new facilities were added at Argonne-West including the Hot Fuel Examination Facility for remote handling and examination of fuels and hardware. In 1978, these examination capabilities were enhanced with the startup of the Neutron Radiography Facility. In 1979, the Transient Reactor Test Facility underwent change to prepare for testing breeder-reactor fuels contained in large loops. Calibration experiments were completed late in the year for these tests.

Breeder reactor research also took place at EG&G Idaho's Engineering Test Reactor. In 1979 alone, 13 safety tests were completed. Engineers and scientists are evaluating results of the tests to help determine safety margins for fast breeder reactors. Those tests will continue through 1982.

Throughout the 70's, the Naval Reactor Facility at the site continued to operate several reactors and train Navy personnel for the nuclear fleet.

With these various activities underway, a group of 45 technicians and scientists kept close watch on the environment, measuring for possible effects from the nuclear research. DOE's Radiological and Evironmental Sciences Laboratory refined its techniques for monitoring air, water and foodstuffs, and also conducted studies on plant and animal life. The site's designation as a National Environmental Research Park also provides a protected, high western desert for universities and others to study.

Alternative energy explored

EG&G Idaho was assigned work on some of the nonnuclear energy options during the 70's. At the Raft River Geothermal Site near Malta, Idaho, researchers continued to study using medium temperature (about 300 degrees F.) geothermal water to generate electricity. The first electricity from a five-megawatt (5,000 kilowatt) plant is expected to be generated in late 1980.

The Raft River site was the scene of some "firsts" in 1979. Geologists successfully conducted the first underground geothermal well-fracturing experiment to release more hot water. This technique could reduce costs of producing power at geothermal sites.

In September, researchers at Raft River used geothermal water to distill alcohol fuel from agricultural products, the first such experiment anywhere. Scientists also used geothermal water to irrigate crops, raise fish and dry agricultural process waste products.

DOE also participated in funding 13 geothermal projects in the Intermountain West, including one in Boise to expand an existing geothermal system and construct a separate system for heating the downtown business district and another for a municipal heating district in Rexburg.

Small hydro dams revived

The uncertain energy picture revived interest in generating electricity at small dams. The Idaho DOE office helped fund several demonstration projects, one of which is significant locally. The bulb turbine plants under construction on the Snake River will supply about a quarter of the Idaho Falls city electrical supply. INEL small hydro experts estimate such dams could possibly supply six per cent of the country's electrical power capacity.

A $37 million Magnetohydrodynamic Component Development and Integration Facility near Butte, Mont., is about 70 per cent complete. That plant will develop components and provide engineering data for a research project aimed at generating electricity direct from coal-fired gasses.

A small program of fusion reactor safety research also was begun at the site.

Under an agreement with Boise Cascade Corporation, DOE built two solar homes. Both houses are instrumented to monitor performance of the solar heating systems.

As an energy conservation move, DOE is converting 150 pickup trucks to use propane fuel. Expected dollar savings are 28 per cent under 1979 costs.